REMARKS/ARGUMENTS

Claims 1-4, 10, 11 and 29-36 are pending. Claims 1, 2, 3, 10, and 11 have been amended. No claim has been canceled. Claims 29-36 have been added. No new matter has been added.

The title of the invention was objected to for not being descriptive. Applicant believes that the current title, "METHOD FOR FABRICATING CAPACITOR OF SEMICONDUCTOR DEVICE" correctly describes the invention as claimed. The claims are directed to "a storage node of a capacitor in a semiconductor device." Applicant, however, would be willing to change the title if the Examiner has a more suitable title in mind.

Claims 1-4 and 10-11 were rejected under 35 U.S.C. § 112, second paragraph. Claim 1 has been amended. Claims 2 and 4 also have been amended.

Claims 1-2 and 10-11 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Yamamoto in view of Thakur. Applicant respectfully traverses the rejection. The claimed invention relates to forming a storage node in a capacitor. The capacitor has first and second plates (or first and second storage nodes) that are separated by a dielectric layer. In the claimed embodiment, the first storage node is made by providing first and second amorphous silicon layers. The first silicon layer is provided with a first doping concentration that would not cause the problem of local agglomeration of dopants. The second silicon layer that is substantially undoped is formed on the first silicon layer and than converted into silicon grains.

Yamamoto does not disclose or suggest the above features. In fact, Yamamoto does not appreciate the problem associated with the local agglomeration of dopants. Note Yamamoto states in paragraph 52, "[t]he concentration of the phosphorous ions in the amorphous silicon film 7 is equal to or more than $1x10^{20}$ cm^{-3}." As explained in the present application, the local agglomeration presents a problem when the dopant concentration is higher than $2 x 10^{20}/cm^3$. Yamamoto's dopant concentration provides no upper limit and suggests using dosages that would cause the local agglomeration problem. Thakur does not remedy this deficiency of Yamamoto. Claim 1 is allowable.

In addition, claim 1 recites, "converting the second amorphous silicon layer to form a plurality of silicon grains on an inner wall of the first amorphous silicon layer, wherein substantially all of the second amorphous silicon layer is converted to the silicon grains to expose portions of the inner wall of the first amorphous silicon layer; doping the first storage node and the silicon grains with dopants until a second doping concentration is reached, the second doping concentration being of sufficient dosage to provide requisite conductivity to the first storage node." Yamamoto does not disclose or suggest these features. Thakur does not remedy the deficiencies of Yamamoto. Claim 1 is allowable for the above reasons as well.

Claim 2 recites, "wherein the first doping concentration ranges from about 1 x $10^{19}/cm^3$ to about 9 x $10^{19}/cm^3$..." Yamamoto states in paragraph that "[t]he concentration of the phosphorous ions the amorphous silicon film 7 is equal to or more than $1x10^{20}$ cm^{-3}." Yamamoto provides no motivation for lowering the concentration level since it does not appear to appreciate the local agglomeration problem, discussed in the present invention. Thakur does not remedy the deficiency of Yamamoto. Claim 2 is allowable at least for this reason.

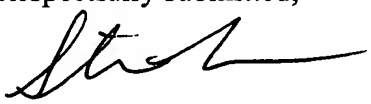
Claim 29 recites "providing a trench on a substrate; forming a first amorphous silicon layer doped with a first doping concentration within the trench, the first amorphous silicon layer having inner and outer walls, the inner wall defining a space within the trench, the first doping concentration ranging from about 1 x $10^{19}/cm^3$ to about 2 x $10^{20}/cm^3$ to suppress dopants from locally agglomerating; forming a second amorphous silicon layer that is substantially undoped on the first amorphous silicon layer in an in-situ condition; patterning the first amorphous silicon layer and the second amorphous silicon layer to form a first storage node; converting the second amorphous silicon layer to form a plurality of silicon grains on the inner wall of the first amorphous silicon layer, wherein substantially all of the second amorphous silicon layer is converted to the silicon grains to expose portions of the inner wall of the first amorphous silicon layer; converting the first amorphous silicon layer to a polysilicon layer; doping the first storage node and the silicon grains with dopants until a second doping concentration is reached, the second doping concentration being of sufficient dosage to provide requisite conductivity to the first storage node..." Neither Yamamoto nor Thakur, alone or in combination, disclose or suggest the features recited. Claim 29 is allowable.

CONCLUSION

In view of the foregoing, Applicants believe all claims now pending in this Application are in condition for allowance. The issuance of a formal Notice of Allowance at an early date is respectfully requested.

If the Examiner believes a telephone conference would expedite prosecution of this application, please telephone the undersigned at 650-326-2400.

Respectfully submitted,



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